

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A radio frequency (RF) linear power amplifier ~~(200)~~ operating in an output frequency band, having an output transistor ~~(Q2)~~, said power amplifier comprising:

~~(a)~~ a circuit means ~~(300)~~ for generating a bias signal producing a quiescent current flowing through said output transistor ~~(Q2)~~ of said RF power ~~amplifier~~, amplifier;

~~(b)~~ a detector circuit means ~~(210)~~ for detecting RF input to said amplifier and generating a driving signal ~~(215)~~ according to a power level of said RF input;

~~(c)~~ a self-adapting circuit means ~~(250)~~ for receiving said driving signal ~~(215)~~ and automatically modifying said bias signal and said quiescent current through said output transistor ~~(Q2)~~, whereby said quiescent current at said output stage is reduced and

PATENT

Serial No. 10/538,347

Amendment in Reply to Office Action of January 17, 2007

optimized for minimum dissipation and optimal linearity at all power output levels; and

wherein the detector circuit means for generating said driving signal is connected to said self adapting circuit means, said self adapting circuit means further including means for filtering out any RF component of said driving signal.

2. (Currently amended) The linear power amplifier as claimed in claim 1, wherein the self-adapting circuit means (250) automatically modifies said quiescent current for an output stage amplifier by tracking said detected RF signal being input to the amplifier at power ranges above a certain power output threshold.

Claim 3 (Canceled)

4. (Currently amended) The A radio frequency (RF) linear power amplifier as claimed in claim 2, operating in an output frequency band, having an output transistor, said power amplifier comprising:
a circuit means for generating a bias signal producing a quiescent current flowing through said output transistor of said RF

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

power amplifier;

a detector circuit means for detecting RF input to said amplifier and generating a driving signal according to a power level of said RF input; and

a self-adapting circuit means for receiving said driving signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels;

wherein the self adapting circuit means ~~(250)~~ includes means ~~(225, 228)~~ for automatically reducing the quiescent current for an output stage amplifier from one state of lower quiescent current to another state of higher quiescent current.

5. (Currently amended) The linear power amplifier as claimed in claim 1, comprising a first output stage and a second power output stage, wherein said detector circuit means ~~(210)~~ detects RF input to said amplifier at said first output stage ~~(Q1)~~, for reducing said quiescent current at a said second output stage

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

(Q2).

6. (Currently amended) The A radio frequency (RF) linear power amplifier as claimed in claim 1, further comprising operating in an output frequency band, having an output transistor, said power amplifier comprising:

a circuit means for generating a bias signal producing a quiescent current flowing through said output transistor of said RF power amplifier;

a detector circuit means for detecting RF input to said amplifier and generating a driving signal according to a power level of said RF input;

a self-adapting circuit means for receiving said driving signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels; and

means (125, 126) for further modifying said quiescent current at a second output stage under discrete voltage control.

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

7. (Currently amended) A device including a radio frequency (RF) linear power amplifier operating in an output frequency band, having an output transistor, said power amplifier comprising:

~~(a)~~ a circuit means ~~(300')~~ for generating a bias signal producing a quiescent current flowing through said output

transistor ~~(Q2)~~ of said RF power amplifier;

~~(b)~~ a detector circuit means ~~(210)~~ for detecting RF input to said amplifier and generating a driving signal ~~(215)~~ according to a power level of said RF input; and

~~(c)~~ a self-adapting circuit means ~~(250)~~ for receiving said driving signal ~~(215)~~ and automatically modifying said bias signal and said quiescent current through said output transistor ~~(Q2)~~, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels;

wherein the detector circuit means for generating said driving signal is connected to said self adapting circuit means, said self adapting circuit further including means for filtering out any RF component of said driving signal.

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

8. (Currently amended) The device as claimed in claim 7, wherein the self-adapting circuit means ~~(210)~~ automatically modifies said quiescent current for an output stage amplifier by tracking said detected RF signal being input to the amplifier at power ranges above a certain power output threshold.

Claim 9 (Canceled)

10. (Currently amended) ~~The A device as claimed in claim 7,~~ including a radio frequency (RF) linear power amplifier operating in an output frequency band, having an output transistor, said power amplifier comprising:

a circuit means for generating a bias signal producing a quiescent current flowing through said output transistor of said RF power amplifier;

a detector circuit means for detecting RF input to said amplifier and generating a driving signal according to a power level of said RF input; and

a self-adapting circuit means for receiving said driving

PATENT

Serial No. 10/538,347

Amendment in Reply to Office Action of January 17, 2007

signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels;

wherein the self adapting circuit means includes means (225, 228) for automatically reducing the quiescent current for an output stage amplifier from one state of lower quiescent current to another state of higher quiescent current.

11. (Currently amended) The device as claimed in claim 7, comprising a first output stage and a second power-output-stages stage, wherein said detector circuit means ~~(210)~~ detects RF input to said amplifier at said first output stage ~~(Q1)~~, for reducing said quiescent current at a said second output stage (Q2).

12. (Currently amended) ~~The A device as claimed in claim 7,~~ further comprising including a radio frequency (RF) linear power amplifier operating in an output frequency band, having an output transistor, said power amplifier comprising:

PATENT

Serial No. 10/538,347

Amendment in Reply to Office Action of January 17, 2007

a circuit means for generating a bias signal producing a quiescent current flowing through said output transistor of said RF power amplifier;

a detector circuit means for detecting RF input to said amplifier and generating a driving signal according to a power level of said RF input;

a self-adapting circuit means for receiving said driving signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels; and

means ~~(125, 126)~~ for further modifying said quiescent current at a second output stage under discrete voltage control.

13. (Currently amended) A self-adapting circuit ~~(250)~~ for dynamically controlling quiescent current flowing through said output transistor of a linear power amplifier operating in an output frequency band, having an output transistor, said linear power amplifier comprising a circuit means ~~(300¹)~~ for generating a

PATENT

Serial No. 10/538,347

Amendment in Reply to Office Action of January 17, 2007

bias signal producing a quiescent current flowing through said output transistor of said RF power amplifier, said self-adapting bias circuit comprising:

a) ~~a detector circuit means (210)~~ for detecting RF input to said amplifier and generating a driving signal ~~(215)~~ according to a power level of said RF input;

b) ~~means (225, 228)~~ for receiving said driving signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels;

wherein the detector circuit means for generating said driving signal is connected to said modifying means, said detector circuit means further including means for filtering out any RF component of said driving signal.

14. (Currently amended) The self-adapting circuit as claimed in claim 13, wherein the modifying means ~~(225, 228)~~ automatically modifies said quiescent current for an output stage amplifier to track said detected RF signal being input to the amplifier at power

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

ranges above a certain power output threshold.

Claim 15 (Canceled)

16. (Currently amended) The ~~A~~ self-adapting circuit as claimed in claim 13, for dynamically controlling quiescent current flowing through said output transistor of a linear power amplifier operating in an output frequency band, having an output transistor, said linear power amplifier comprising a circuit means for generating a bias signal producing a quiescent current flowing through said output transistor of said RF power amplifier, said self-adapting bias circuit comprising:

a detector circuit means for detecting RF input to said amplifier and generating a driving signal according to a power level of said RF input;

means for receiving said driving signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels;

PATENT
Serial No. 10/538,347
Amendment in Reply to Office Action of January 17, 2007

wherein said circuit means for generating a bias signal producing a quiescent current comprises a differential transistor pair ~~(325)~~, said modifying means is connected to one side of said differential pair for automatically modifying said quiescent current for an output stage amplifier according to said detected RF signal input.

17. (Currently amended) The self-adapting circuit as claimed in claim 13, wherein said linear power amplifier comprises a first ~~(Q1) and a second output stage (Q2) power output stages stage,~~ wherein said detector circuit means detects RF input to said amplifier at said first output stage, for reducing said quiescent current at a said second output stage ~~(Q2)~~.

18. (Currently amended) ~~The A~~ self-adapting circuit as claimed in claim 13, for dynamically controlling quiescent current flowing through said output transistor of a linear power amplifier operating in an output frequency band, having an output transistor, said linear power amplifier comprising a circuit means for generating a bias signal producing a quiescent current flowing

PATENT

Serial No. 10/538,347

Amendment in Reply to Office Action of January 17, 2007

through said output transistor of said RF power amplifier, said self-adapting bias circuit comprising:

a detector circuit means for detecting RF input to said amplifier and generating a driving signal according to a power level of said RF input;

means for receiving said driving signal and automatically modifying said bias signal and said quiescent current through said output transistor, whereby said quiescent current at said output stage is reduced and optimized for minimum dissipation and optimal linearity at all power output levels;

wherein said second power output stage firer includes means ~~(125, 126)~~ for further modifying said quiescent current at a second output stage under discrete voltage control.

19. (New) An amplifier comprising:

a bias circuit configured to generate a bias signal for biasing the amplifier;

a detector configured to detect an input of the amplifier and generate a driving signal related to an input of the amplifier; and

a self-adapting circuit configured to receive the driving

PATENT

Serial No. 10/538,347

Amendment in Reply to Office Action of January 17, 2007

signal and automatically modify the bias signal to a first level when an output power level of the amplifier exceeds a first threshold and modify the bias signal to a second level when the output power level exceeds a second threshold.